

FRAV2002-0020 Sequence Listing.ST25.txt SEQUENCE LISTING

| <110> | HAMPE BRICE PRADII ROONE | , Olga , Corno , Alex ER, Lau Y, Thom IER, A | is urent nas | | | | | | | | | | | |
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| <120> | | D FOR I | | | | | | | | | | то г | MODIFY | THE |
| <130> | FRAV2 | 002-002 | 20 US | NP | | | | | | | | | | |
| <150> <151> | GB 022 2002- | 29934.! 12-20 | 5 | | | | | | | | | | | |
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| <170> | Paten | tIn ve | rsion | 3.2 | | | | | | | | | | |
| <210> <211> <212> <213> | | sapiens | 5 | | | | | | | | | | | |
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| cgt gt Arg Va | l Glu I | ctt cco Leu Pro 20 | acc Thr | tgc Cys | atg Met | tac Tyr 25 | cgg Arg | ctc Leu | ccc Pro | aac Asn | gtg Val 30 | cac His | ggc Gly | 96 |
| agg ag Arg Se | c tac o r Tyr o 35 | ggc cca Gly Pro | gcg Ala | ccg Pro | ggc Gly 40 | gct Ala | ggc Gly | cac His | gtg Val | cag Gln 45 | gaa Glu | gag Glu | tct Ser | 144 |
| aac cte Asn Lei 50 | | | | | | | | | | | | | | 192 |
| cgt cte Arg Le 65 | | | | | | | | | | | | | | 240 |
| caa aca Gln Th | a cca o r Pro A | gat gca Asp Ala 85 | gac S Asp | ttg Leu | gat Asp | gta Val | acc Thr 90 | aac Asn | ata Ile | atc Ile | caa Gln | gcg Ala 95 | gat Asp | 288 |
| gag cc Glu Pro | o Thr] | act tta Thr Lei 100 | acc Thr | acc Thr | aat Asn | gcg Ala 105 | ctg Leu | gac Asp | ttg Leu | aat Asn | tca Ser 110 | gtg Val | ctt Leu | 336 |

| ggg Gly | aag Lys | gat Asp 115 | tac Tyr | ggg Gly | gcg | ctg | aaa | 0020 gac Asp | atc | gtg | atc | aac | gca | aac | ccg | 384 |
|-------------------|-------------------|-------------------|------------|-------------------|-------------------|-------------------|-------------------|--------------------|-------------------|-------------------|-------------------|-------------------|------------|-------------------|-------------------|------|
| gcc Ala | tcc ser 130 | cct Pro | ccc Pro | ctc Leu | tcc Ser | ctg Leu 135 | ctt Leu | gtg Val | ctg Leu | cac His | agg Arg 140 | ctg Leu | ctc Leu | tgt Cys | gag Glu | 432 |
| cac His 145 | ttc Phe | agg Arg | gtc Val | ctg Leu | tcc Ser 150 | acg Thr | gtg val | cac His | acg Thr | cac His 155 | tcc Ser | tcg Ser | gtc val | aag Lys | agc Ser 160 | 480 |
| | | | | | | | | ttt Phe | | | | | | | | 528 |
| | | | | | | | | ttc Phe 185 | | | | | | | | 576 |
| ccg Pro | aag Lys | acg Thr 195 | cag Gln | atg Met | aaa Lys | ttc Phe | agc Ser 200 | atc Ile | cag Gln | acg Thr | atg Met | tgc Cys 205 | ccc Pro | atc Ile | gaa Glu | 624 |
| ggc Gly | gaa Glu 210 | ggg Gly | aac Asn | att Ile | gca Ala | cgt Arg 215 | ttc Phe | ttg Leu | ttc Phe | tct Ser | ctg Leu 220 | ttt Phe | ggc Gly | cag Gln | aag Lys | 672 |
| | | | | | | | | ata Ile | | | | | | | | 720 |
| att Ile | ttt Phe | cag Gln | tta Leu | aaa Lys 245 | gag Glu | gga Gly | agc Ser | agt Ser | aaa Lys 250 | gaa Glu | aaa Lys | gcc Ala | gct Ala | gtt Val 255 | ttc Phe | 768 |
| | | | | | | | | aag Lys 265 | | | | | | | | 816 |
| gaa Glu | ctc Leu | acc Thr 275 | gta Val | gca Ala | gac Asp | gtg Val | gtg Val 280 | ctg Leu | tgg Trp | tct Ser | gta Val | ctc Leu 285 | cag Gln | cag Gln | atc Ile | 864 |
| gga Gly | ggc Gly 290 | tgc Cys | agt Ser | gtg Val | aca Thr | gtg Val 295 | cca Pro | gcc Ala | aat Asn | gtg Val | cag Gln 300 | agg Arg | tgg Trp | atg Met | agg Arg | 912 |
| | | | | | | | | aac Asn | | | | | | | | 960 |
| tga | atto | jccgt | aa d | tgat | ttta | ıa aç | ggtt | taga | ttt | taag | gaat | ggtg | jctc1 | tt | | 1013 |
| cato | ccta | itt a | atcag | jtaag | 9 9 99 | jactt | gtat | tag | gagto | aga | gtct | tttt | at t | tagg | gccagt | 1073 |
| tgto | aagt | gt d | caata | aaag | jc at | cato | taat | : tta | ıaaaa | ıaaa | aaaa | ıaaaa | aa a | acto | gag | 1131 |

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Arg Val Glu Leu Pro Thr Cys Met Tyr Arg Leu Pro Asn Val His Gly
20 25 30

Arg Ser Tyr Gly Pro Ala Pro Gly Ala Gly His Val Gln Glu Glu Ser 35 40 45

Asn Leu Ser Leu Gln Ala Leu Glu Ser Arg Gln Asp Asp Ile Leu Lys 50 60

Arg Leu Tyr Glu Leu Lys Ala Ala Val Asp Gly Leu Ser Lys Met Ile 65 70 75 80

Gln Thr Pro Asp Ala Asp Leu Asp Val Thr Asn Ile Ile Gln Ala Asp 85 90 95

Glu Pro Thr Thr Leu Thr Thr Asn Ala Leu Asp Leu Asn Ser Val Leu 100 105 110

Gly Lys Asp Tyr Gly Ala Leu Lys Asp Ile Val Ile Asn Ala Asn Pro 115 120 125

Ala Ser Pro Pro Leu Ser Leu Leu Val Leu His Arg Leu Leu Cys Glu 130 135 140

His Phe Arg Val Leu Ser Thr Val His Thr His Ser Ser Val Lys Ser 145 150 155 160

Val Pro Glu Asn Leu Leu Lys Cys Phe Gly Glu Gln Asn Lys Lys Gln
165 170 175

Pro Arg Gln Asp Tyr Gln Leu Gly Phe Thr Leu Ile Trp Lys Asn Val 180 185 190

Pro Lys Thr Gln Met Lys Phe Ser Ile Gln Thr Met Cys Pro Ile Glu 195 200 205

Gly Glu Gly Asn Ile Ala Arg Phe Leu Phe Ser Leu Phe Gly Gln Lys 210 220

His Asn Ala Val Asn Ala Thr Leu Ile Asp Ser Trp Val Asp Ile Ala 225 230 235 240 FRAV2002-0020 Sequence Listing.ST25.txt Ile Phe Gln Leu Lys Glu Gly Ser Ser Lys Glu Lys Ala Ala Val Phe 245 250 255 Arg Ser Met Asn Ser Ala Leu Gly Lys Ser Pro Trp Leu Ala Gly Asn 260 265 270 Glu Leu Thr Val Ala Asp Val Val Leu Trp Ser Val Leu Gln Gln Ile 275 280 285 Gly Gly Cys Ser Val Thr Val Pro Ala Asn Val Gln Arg Trp Met Arg 290 295 300 Ser Cys Glu Asn Leu Ala Pro Phe Asn Thr Ala Leu Lys Leu Leu Lys <210> 320 <211> <212> PRT <213> Homo sapiens <400> Met Pro Met Tyr Gln Val Lys Pro Tyr His Gly Gly Gly Ala Pro Leu 1 5 10 15 Arg Val Glu Leu Pro Thr Cys Met Tyr Arg Leu Pro Asn Val His Gly
20 25 30 Arg Ser Tyr Gly Pro Ala Pro Gly Ala Gly His Val Gln Glu Glu Ser 35 40 45 Asn Leu Ser Leu Gl
n Ala Leu Glu Ser Arg Gl
n Asp Asp Ile Leu Lys $50 \hspace{1.5cm} 55 \hspace{1.5cm} 60$ Arg Leu Tyr Glu Leu Lys Ala Ala Val Asp Gly Leu Ser Lys Met Ile 65 70 75 80 Gln Thr Pro Asp Ala Asp Leu Asp Val Thr Asn Ile Ile Gln Ala Asp 85 90 95 Glu Pro Thr Thr Leu Thr Thr Asn Ala Leu Asp Leu Asn Ser Val Leu 100 105 110 Gly Lys Asp Tyr Gly Ala Leu Lys Asp Ile Val Ile Asn Ala Asn Pro 115 120 125 Ala Ser Pro Pro Leu Ser Leu Leu Val Leu His Arg Leu Leu Cys Glu 130 135 140

| ніs 145 | Phe | Arg | val | Leu | | | | His | | | | | | | | | |
|------------------------------|------------|-------------|------------|-----------------|------------|------------|----------------|--------------|--------------|-------------------|--------------|--------------|------------|---------------------|------------|-----|---|
| Val | Pro | Glu | Asn | Leu 165 | Leu | Lys | Cys | Phe | Gly 170 | Glu | G]n | Asn | Lys | Lys 175 | Gln | | |
| Pro | Arg | Gln | Asp 180 | Tyr | Gln | Leu | Gly | Phe 185 | Thr | Leu | Ile | Тгр | Lys 190 | Asn | val | | |
| Pro | Lys | Thr 195 | Gln | Met | Lys | Phe | Ser 200 | Ile | Gln | Thr | Met | Cys 205 | Pro | Ile | Glu | | |
| Gly | Glu 210 | Gly | Asn | Ile | Ala | Arg 215 | Phe | Leu | Phe | Ser | Leu 220 | Phe | Gly | Gln | Lys | | |
| His 225 | Asn | Ala | Val | Asn | Ala 230 | Thr | Leu | Ile | Asp | Ser 235 | Trp | Val | Asp | Ile | Ala 240 | | |
| Ile | Phe | G1n | Leu | Lys 245 | Glu | Gly | Ser | Ser | Lys 250 | Glu | Lys | Ala | Αla | Va1 255 | Phe | | |
| Arg | Ser | Met | Asn 260 | Ser | Ala | Leu | Gly | Lys 265 | Ser | Pro | Trp | Leu | Ala 270 | Gly | Asn | | |
| Glu | Leu | Thr 275 | Val | Ala | Asp | val | Val 280 | Leu | Trp | Ser | Val | Leu 285 | Gln | Gln | Ile | | |
| Glу | G]y 290 | Cys | Ser | Val | Thr | va1 295 | Pro | Ala | Asn | val | G]n 300 | Arg | Trp | Met | Arg | | |
| Ser 305 | Cys | Glu | Asn | Leu | Ala 310 | Pro | Phe | Asn | Thr | Ala 315 | Leu | Lys | Leu | Leu | Lys 320 | | |
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| ttco | ttgg | ıgt t | ccca | icc a M 1 | let P | cg a | itg t let T | ac c yr c | ag g In v | ita a 'al L | ag c ys F | cc t ro T | yr F | at g lis G .0 | ga Ty | 110 | 0 |
| ggc Gly | agc Ser | gca Ala | cct Pro | ctg Leu | cgt Arg | gta Val | gag Glu | ctt Leu | Pro | acc Thr age | Cys | atg Met | tac Tyr | cgg Arg | ctc Leu | 158 | 8 |

| | | | тэ | | | | | 20 | | | | | 23 | | | |
|------------|-------------------|-------------------|-------------------|-------------------|------------|-------------------|-------------------|-------------------|-------------------|-------------|-------------------|-------------------|-------------------|-------------------|------------|-----|
| ccc Pro | aac Asn | gtg Val 30 | cac His | agc Ser | aag Lys | acc Thr | acc Thr 35 | agc Ser | ccc Pro | gcc Ala | acc Thr | gac Asp 40 | gcg Ala | ggc Gly | cac His | 206 |
| gtg Val | cag Gln 45 | gaa Glu | aca Thr | tcc Ser | gag Glu | cct Pro 50 | tct Ser | ttg Leu | caa Gln | gcc Ala | ctt Leu 55 | gaa Glu | tct Ser | cgc Arg | caa Gln | 254 |
| | | | tta Leu | | | | | | | | | | | | | 302 |
| ctt Leu | tca Ser | aag Lys | atg Met | att Ile 80 | cac His | acc Thr | cca Pro | gat Asp | gca Ala 85 | gac Asp | ttg Leu | gac Asp | gta Val | acc Thr 90 | aac Asn | 350 |
| | | | gct Ala 95 | | | | | | | | | | | | | 398 |
| ttg Leu | aat Asn | tcc Ser 110 | gtg Val | ctt Leu | gga Gly | aag Lys | gac Asp 115 | tat Tyr | ggg Gly | gcg Ala | ctg Leu | aaa Lys 120 | gac Asp | att Ile | gtg Val | 446 |
| atc Ile | aac Asn 125 | gca Ala | aac Asn | cca Pro | gcc Ala | tcc Ser 130 | cca Pro | cca Pro | ctg Leu | tcc Ser | ctg Leu 135 | ctt Leu | gtg Val | ctg Leu | cac His | 494 |
| | | | tgt Cys | | | | | | | | | | | | | 542 |
| tcg Ser | tct Ser | gtc Val | aag Lys | aat Asn 160 | gtg Val | ccc Pro | gag Glu | aat Asn | ctt Leu 165 | gtc Val | aag Lys | tgc Cys | ttć Phe | ggg Gly 170 | gag Glu | 590 |
| cag Gln | gct Ala | agg Arg | aag Lys 175 | cag Gln | tcc Ser | cgc Arg | cac His | gag Glu 180 | tat Tyr | cag Gln | ctg Leu | ggc Gly | ttc Phe 185 | act Thr | ctg Leu | 638 |
| | | | aat Asn | | | | | | | | | | | | | 686 |
| atg Met | tgc Cys 205 | ccc Pro | att Ile | gaa Glu | gga Gly | gaa Glu 210 | ggg Gly | aac Asn | atc Ile | gca Ala | cgt Arg 215 | ttc Phe | ctg Leu | ttc Phe | tct Ser | 734 |
| | | | cag Gln | | | | | | | | | | | | | 782 |
| | | | atc Ile | | | | | | | | | | | | | 830 |
| aaa Lys | gcg Ala | gcc Ala | gtg Val 255 | ttc Phe | cgc Arg | tct Ser | atg Met | aac Asn 260 | tcc Ser | gct Ala | ttg Leu | ggg Gly | agg Arg 265 | agc Ser | | 878 |
| tgg | ctg | gtt | gga | aat | gag | ctc | act | gtg | | gat Page | | gtg | ctg | tgg | tct | 926 |

| FRAV2002-0020 Sequence Listing.ST25.txt Trp Leu Val Gly Asn Glu Leu Thr Val Ala Asp Val Val Leu Trp Ser 270 275 280 | |
|---|------|
| gtg ctc cag cag act ggg ggc agc agt ggg gca gca ccc acc aat gtg Val Leu Gln Gln Thr Gly Gly Ser Ser Gly Ala Ala Pro Thr Asn Val 285 290 295 | 974 |
| cag cgg tgg ctt aag tcc tgt gaa aac ctg gcc ccc ttc agc act gcc Gln Arg Trp Leu Lys Ser Cys Glu Asn Leu Ala Pro Phe Ser Thr Ala 300 305 310 315 | 1022 |
| ctt cag ctc ctt aag tga attcgagcag cttgtcttgc agggttcaac Leu Gln Leu Leu Lys 320 | 1070 |
| agaagaatgg tacggcttcc agtctgttgt cagaaaggga cttgtccaat aaagtaccat | 1130 |
| atcatctaaa aaaaaaaaa aaaaaaaaaa aaaaaaaa | 1190 |
| aaaaaaaaaa aaaaaaaaaaaaaaaaaaaaaaaaaaa | 1233 |
| <210> 5 <211> 320 <212> PRT <213> Mus musculus | |
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| Arg Val Glu Leu Pro Thr Cys Met Tyr Arg Leu Pro Asn Val His Ser 20 25 30 | |
| Lys Thr Thr Ser Pro Ala Thr Asp Ala Gly His Val Gln Glu Thr Ser 35 40 45 | |
| Glu Pro Ser Leu Gln Ala Leu Glu Ser Arg Gln Asp Asp Ile Leu Lys 50 60 | |
| Arg Leu Tyr Glu Leu Lys Ala Ala Val Asp Gly Leu Ser Lys Met Ile 65 70 80 | |
| His Thr Pro Asp Ala Asp Leu Asp Val Thr Asn Ile Leu Gln Ala Asp 85 90 95 | |
| Glu Pro Thr Thr Leu Ala Thr Asn Thr Leu Asp Leu Asn Ser Val Leu 100 105 110 | |
| Gly Lys Asp Tyr Gly Ala Leu Lys Asp Ile Val Ile Asn Ala Asn Pro 115 120 125 | |
| Ala Ser Pro Pro Leu Ser Leu Leu Val Leu His Arg Leu Leu Cys Glu 130 135 140 Page 7 | |

Arg Tyr Arg Val Leu Ser Thr Val His Thr His Ser Ser Val Lys Asn Val Pro Glu Asn Leu Val Lys Cys Phe Gly Glu Gln Ala Arg Lys Gln
165 170 175 Ser Arg His Glu Tyr Gln Leu Gly Phe Thr Leu Ile Trp Lys Asn Val 180 185 190 Pro Lys Thr Gln Met Lys Phe Ser Val Gln Thr Met Cys Pro Ile Glu 195 200 205 Gly Glu Gly Asn Ile Ala Arg Phe Leu Phe Ser Leu Phe Gly Gln Lys 210 220 His Asn Ala Val Thr Leu Thr Leu Ile Asp Ser Trp Val Asp Ile Ala 225 230 235 240 Met Phe Gln Leu Arg Glu Gly Ser Ser Lys Glu Lys Ala Ala Val Phe 245 250 255 Arg Ser Met Asn Ser Ala Leu Gly Arg Ser Pro Trp Leu Val Gly Asn 260 265 270 Glu Leu Thr Val Ala Asp Val Val Leu Trp Ser Val Leu Gln Gln Thr Gly Gly Ser Ser Gly Ala Ala Pro Thr Asn Val Gln Arg Trp Leu Lys 290 295 300 Ser Cys Glu Asn Leu Ala Pro Phe Ser Thr Ala Leu Gln Leu Leu Lys <210> <211> 320 <212> PRT <213> Mus musculus <400> 6

Met Pro Met Tyr Gln Val Lys Pro Tyr His Gly Gly Ser Ala Pro Leu 15

Arg Val Glu Leu Pro Thr Cys Met Tyr Arg Leu Pro Asn Val His Ser 25

Lys Thr Thr Ser Pro Ala Thr Asp Ala Gly His Val Gln Glu Thr Ser 35 40 45
Page 8

Glu Pro Ser Leu Gln Ala Leu Glu Ser Arg Gln Asp Asp Ile Leu Lys 50 60 Arg Leu Tyr Glu Leu Lys Ala Ala Val Asp Gly Leu Ser Lys Met Ile 65 70 75 80 His Thr Pro Asp Ala Asp Leu Asp Val Thr Asn Ile Leu Gln Ala Asp 85 90 95 Glu Pro Thr Thr Leu Ala Thr Asn Thr Leu Asp Leu Asn Ser Val Leu 100 105 110 Gly Lys Asp Tyr Gly Ala Leu Lys Asp Ile Val Ile Asn Ala Asn Pro 115 120 125 Ala Ser Pro Pro Leu Ser Leu Leu Val Leu His Arg Leu Leu Cys Glu 130 135 140 Arg Tyr Arg Val Leu Ser Thr Val His Thr His Ser Ser Val Lys Asn 145 150 155 160 Val Pro Glu Asn Leu Val Lys Cys Phe Gly Glu Gln Ala Arg Lys Gln 165 170 175 Ser Arg His Glu Tyr Gln Leu Gly Phe Thr Leu Ile Trp Lys Asn Val 180 185 190 Pro Lys Thr Gln Met Lys Phe Ser Val Gln Thr Met Cys Pro Ile Glu 195 200 205 Gly Glu Gly Asn Ile Ala Arg Phe Leu Phe Ser Leu Phe Gly Gln Lys 210 220 His Asn Ala Val Thr Leu Thr Leu Ile Asp Ser Trp Val Asp Ile Ala 225 230 235 240 Met Phe Gln Leu Arg Glu Gly Ser Ser Lys Glu Lys Ala Ala Val Phe 245 250 255 Arg Ser Met Asn Ser Ala Leu Gly Arg Ser Pro Trp Leu Val Gly Asn 260 265 270 Glu Leu Thr Val Ala Asp Val Val Leu Trp Ser Val Leu Gln Gln Thr 275 280 285 Gly Gly Ser Ser Gly Ala Ala Pro Thr Asn Val Gln Arg Trp Leu Lys Page 9

| Ser 0 305 | Cys | Glu | Asn | Leu | Ala 310 | Pro | Phe | Ser | Thr | Ala 315 | Leu | Gln | Leu | Leu | Lys 320 | |
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| gggcc | ctgt | tc (| ctgg | cccg | ca go | ccgc | cacci | t ac | ccag | tgac | c a ¹ | tg a | ta g le V | tg ti al Ph | tt gtc ne Val 5 | 116 |
| agg t Arg P | ttc Phe | aac Asn | tcc Ser | agc ser 10 | cat His | ggt Gly | ttc Phe | cca Pro | gtg Val 15 | gag Glu | gtc Val | gat Asp | tct Ser | gac Asp 20 | acc Thr | 164 |
| agc a Ser I | atc []e | ttc Phe | cag Gln 25 | ctc Leu | aag Lys | gag Glu | gtg Val | gtt Val 30 | gct Ala | aag Lys | cga Arg | cag Gln | ggg Gly 35 | gtt Val | ccg Pro | 212 |
| gct g Ala A | gac Asp | cag G1n 40 | ttg Leu | cgt Arg | gtg Val | att Ile | ttc Phe 45 | gca Ala | ggg Gly | aag Lys | gag Glu | ctg Leu 50 | agg Arg | aat Asn | gac Asp | 260 |
| tgg a Trp T | | | | | | | | | | | | | | | | 308 |
| gtg c Val G 70 | ag In | aga Arg | ccg Pro | tgg Trp | aga Arg 75 | aaa Lys | ggt Gly | caa Gln | gaa Glu | atg Met 80 | aat Asn | gca Ala | act Thr | gga Gly | ggc Gly 85 | 356 |
| gac g Asp A | gac Asp | ccc Pro | aga Arg | aac Asn 90 | gcg Ala | gcg Ala | gga Gly | ggc Gly | tgt Cys 95 | gag Glu | cgg Arg | gag Glu | ccc Pro | cag Gln 100 | agc Ser | 404 |
| ttg a Leu T | | | | | | | | | | | | | | | | 452 |
| ggg c Gly L | tg eu | gct Ala 120 | gtc Val | att Ile | ctg Leu | cac His | act Thr 125 | gac Asp | agc Ser | agg Arg | aag Lys | gac Asp 130 | tca Ser | cca Pro | cca Pro | 500 |
| gct g Ala G 1 | gga 51 y L3 5 | agt Ser | cca Pro | gca Ala | ggt Gly | aga Arg 140 | tca Ser | atc Ile | tac Tyr | aac Asn | agc Ser 145 | ttt Phe | tat Tyr | gtg Val | tat Tyr | 548 |
| tgc a Cys L 150 | aa .ys | ggc Gly | ccc Pro | tgt Cys | caa Gln 155 | aga Arg | gtg Val | cag Gln | Pro | gga Gly 160 age | Lys | ctc Leu | agg Arg | gta Val | cag Gln 165 | 596 |

| tgc Cys | agc Ser | acc Thr | tgc Cys | agg Arg 170 | cag Gln | gca Ala | acg Thr | ctc Leu | acc Thr 175 | ttg Leu | acc Thr | cag Gln | ggt Gly | cca Pro 180 | tct Ser | 644 |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| tgc Cys | tgg Trp | gat Asp | gat Asp 185 | gtt Val | tta Leu | att Ile | cca Pro | aac Asn 190 | cgg Arg | atg Met | agt Ser | ggt Gly | gaa Glu 195 | tgc Cys | caa Gln | 692 |
| tcc Ser | cca Pro | cac His 200 | tgc Cys | cct Pro | ggg Gly | act Thr | agt Ser 205 | gca Ala | gaa Glu | ttt Phe | ttc Phe | ttt Phe 210 | aaa Lys | tgt Cys | gga Gly | 740 |
| gca Ala | cac His 215 | ccc Pro | acc Thr | tct Ser | gac Asp | aag Lys 220 | gaa Glu | aca Thr | cca Pro | gta Val | gct Ala 225 | ttg Leu | cac His | ctg Leu | atc Ile | 788 |
| | | | | | | | | | | | | | | gtc val | | 836 |
| agc Ser | ccc Pro | gtc Val | ctg Leu | gtt Val 250 | ttc Phe | cag Gln | tgc Cys | aac Asn | tcc ser 255 | cgc Arg | cac His | gtg Val | att Ile | tgc Cys 260 | tta Leu | 884 |
| gac Asp | tgt Cys | ttc Phe | cac His 265 | tta Leu | tac Tyr | tgt Cys | gtg Val | aca Thr 270 | aga Arg | ctc Leu | aat Asn | gat Asp | cgg Arg 275 | cag Gln | ttt Phe | 932 |
| gtt Val | cac His | gac Asp 280 | cct Pro | caa Gln | ctt Leu | ggc Gly | tac Tyr 285 | tcc Ser | ctg Leu | cct Pro | tgt Cys | gtg Va1 290 | gct Ala | ggc Gly | tgt Cys | 980 |
| ccc Pro | aac Asn 295 | tcc Ser | ttg Leu | att Ile | aaa Lys | gag Glu 300 | ctc Leu | cat His | cac His | ttc Phe | agg Arg 305 | att Ile | ctg Leu | gga Gly | gaa Glu | 1028 |
| gag Glu 310 | cag Gln | tac Tyr | aac Asn | cgg Arg | tac Tyr 315 | cag Gln | cag Gln | tat Tyr | ggt Gly | gca Ala 320 | gag Glu | gag Glu | tgt Cys | gtc val | ctg Leu 325 | 1076 |
| cag Gln | atg Met | ggg Gly | ggc Gly | gtg Val 330 | tta Leu | tgc Cys | ccc Pro | cgc Arg | cct Pro 335 | ggc Gly | tgt Cys | gga Gly | gcg Ala | ggg G1y 340 | ctg Leu | 1124 |
| ctg Leu | ccg Pro | gag Glu | cct Pro 345 | gac Asp | cag Gln | agg Arg | aaa Lys | gtc Val 350 | acc Thr | tgc Cys | gaa Glu | ggg Gly | ggc Gly 355 | aat Asn | ggc Gly | 1172 |
| ctg Leu | ggc Gly | tgt Cys 360 | ggg Gly | ttt Phe | gcc Ala | ttc Phe | tgc Cys 365 | cgg Arg | gaa Glu | tgt Cys | aaa Lys | gaa Glu 370 | gcg Ala | tac Tyr | cat His | 1220 |
| gaa Glu | ggg G1y 375 | gag Glu | tgc Cys | agt Ser | gcc Ala | gta Val 380 | ttt Phe | gaa Glu | gcc Ala | tca Ser | gga Gly 385 | aca Thr | act Thr | act Thr | cag Gln | 1268 |
| gcc Ala 390 | tac Tyr | aga Arg | gtc Val | gat Asp | gaa Glu 395 | aga Arg | gcc Ala | gcc Ala | gag Glu | cag G1n 400 | gct Ala | cgt Arg | tgg Trp | gaa Glu | gca Ala 405 | 1316 |
| gcc Ala | tcc Ser | aaa Lys | gaa Glu | acc Thr | atc Ile | aag Lys | aaa Lys | acc Thr | Thr | aag Lys age | Pro | tgt Cys | ccc Pro | cgc Arg | tgc Cys | 1364 |

| cat gta cca gtg gaa aaa aat gga His Val Pro Val Glu Lys Asn Gly 425 | ggc tgc atg Gly Cys Met 430 | cac atg aag tgt ccg His Met Lys Cys Pro 435 | 1412 |
|---|-----------------------------------|---|------|
| cag ccc cag tgc agg ctc gag tgg Gln Pro Gln Cys Arg Leu Glu Trp 440 445 | tgc tgg aac Cys Trp Asn | tgt ggc tgc gag tgg Cys Gly Cys Glu Trp 450 | 1460 |
| aac cgc gtc tgc atg ggg gac cac Asn Arg Val Cys Met Gly Asp His 455 460 | tgg ttc gac Trp Phe Asp | gtg tag ccagggcggc Val 465 | 1509 |
| cgggcgcccc atcgccacat cctgggggag | catacccagt | gtctaccttc attttctaat | 1569 |
| tctctttca aacacacaca cacacgcgcg | cgcgcgcaca | cacactcttc aagtttttt | 1629 |
| caaagtccaa ctacagccaa attgcagaag | aaactcctgg | atccctttca ctatgtccat | 1689 |
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| aagacagcag agccatctgc gacaccacca | acaggcgttc | tcagcctccg gatgacacaa | 1809 |
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Page 12

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35 40 45 Glu Leu Arg Asn Asp Trp Thr Val Gln Asn Cys Asp Leu Asp Gln Gln 50 55 60 Ser Ile Val His Ile Val Gln Arg Pro Trp Arg Lys Gly Gln Glu Met 65 70 75 80 Asn Ala Thr Gly Gly Asp Asp Pro Arg Asn Ala Ala Gly Gly Cys Glu 85 90 95 Arg Glu Pro Gln Ser Leu Thr Arg Val Asp Leu Ser Ser Ser Val Leu 100 105 110 Pro Gly Asp Ser Val Gly Leu Ala Val Ile Leu His Thr Asp Ser Arg 115 120 125 Lys Asp Ser Pro Pro Ala Gly Ser Pro Ala Gly Arg Ser Ile Tyr Asn 130 135 Ser Phe Tyr Val Tyr Cys Lys Gly Pro Cys Gln Arg Val Gln Pro Gly 145 150 155 160 Lys Leu Arg Val Gln Cys Ser Thr Cys Arg Gln Ala Thr Leu Thr Leu 165 170 175 Thr Gln Gly Pro Ser Cys Trp Asp Asp Val Leu Ile Pro Asn Arg Met 180 185 190Ser Gly Glu Cys Gln Ser Pro His Cys Pro Gly Thr Ser Ala Glu Phe 195 200 205 Phe Phe Lys Cys Gly Ala His Pro Thr Ser Asp Lys Glu Thr Pro Val 210 215 220

Page 13

Ala Leu His Leu Ile Ala Thr Asn Ser Arg Asn Ile Thr Cys Ile Thr 235 235 240Cys Thr Asp Val Arg Ser Pro Val Leu Val Phe Gln Cys Asn Ser Arg 245 250 255 His Val Ile Cys Leu Asp Cys Phe His Leu Tyr Cys Val Thr Arg Leu 260 265 270 Asn Asp Arg Gln Phe Val His Asp Pro Gln Leu Gly Tyr Ser Leu Pro 275 280 285 Cys Val Ala Gly Cys Pro Asn Ser Leu Ile Lys Glu Leu His His Phe 290 295 300 Arg Ile Leu Gly Glu Glu Gln Tyr Asn Arg Tyr Gln Gln Tyr Gly Ala 305 310 315 320 Glu Glu Cys Val Leu Gln Met Gly Gly Val Leu Cys Pro Arg Pro Gly 325 330 335 Cys Gly Ala Gly Leu Leu Pro Glu Pro Asp Gln Arg Lys Val Thr Cys 340 345 350 Glu Gly Gly Asn Gly Leu Gly Cys Gly Phe Ala Phe Cys Arg Glu Cys 355 360 365 Glu Ala Tyr His Glu Gly Glu Cys Ser Ala Val Phe Glu Ala Ser 370 375 380 Gly Thr Thr Gln Ala Tyr Arg Val Asp Glu Arg Ala Ala Glu Gln 385 390 395 400 Ala Arg Trp Glu Ala Ala Ser Lys Glu Thr Ile Lys Lys Thr Thr Lys 405 410 415 Pro Cys Pro Arg Cys His Val Pro Val Glu Lys Asn Gly Gly Cys Met 420 425 430 His Met Lys Cys Pro Gln Pro Gln Cys Arg Leu Glu Trp Cys Trp Asn 435 440 445 Cys Gly Cys Glu Trp Asn Arg Val Cys Met Gly Asp His Trp Phe Asp 450 460

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Ser Phe Tyr Val Tyr Cys Lys Gly Pro Cys Gln Arg Val Gln Pro Gly 145 150 155 160

Lys Leu Arg Val Gln Cys Ser Thr Cys Arg Gln Ala Thr Leu Thr Leu 165 170 175

Thr Gln Gly Pro Ser Cys Trp Asp Asp Val Leu Ile Pro Asn Arg Met 180 185 190

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Phe Phe Lys Cys Gly Ala His Pro Thr Ser Asp Lys Glu Thr Pro Val Page 15 Ala Leu His Leu Ile Ala Thr Asn Ser Arg Asn Ile Thr Cys Ile Thr 225 230 235 240 Cys Thr Asp Val Arg Ser Pro Val Leu Val Phe Gln Cys Asn Ser Arg 245 250 255 His Val Ile Cys Leu Asp Cys Phe His Leu Tyr Cys Val Thr Arg Leu 260 265 270 Asn Asp Arg Gln Phe Val His Asp Pro Gln Leu Gly Tyr Ser Leu Pro 275 280 285 Val Ala Gly Cys Pro Asn Ser Leu Ile Lys Glu Leu His His Phe 290 295 300 Arg Ile Leu Gly Glu Glu Gln Tyr Asn Arg Tyr Gln Gln Tyr Gly Ala 305 310 315 320 Glu Glu Cys Val Leu Gln Met Gly Gly Val Leu Cys Pro Arg Pro Gly 325 330 335 Cys Gly Ala Gly Leu Leu Pro Glu Pro Asp Gln Arg Lys Val Thr Cys 340 350 Glu Gly Gly Asn Gly Leu Gly Cys Gly Phe Ala Phe Cys Arg Glu Cys 355 360 365 Lys Glu Ala Tyr His Glu Gly Glu Cys Ser Ala Val Phe Glu Ala Ser 370 380 Gly Thr Thr Gln Ala Tyr Arg Val Asp Glu Arg Ala Ala Glu Gln 385 395 400 Ala Arg Trp Glu Ala Ala Ser Lys Glu Thr Ile Lys Lys Thr Thr Lys 405 410 415Pro Cys Pro Arg Cys His Val Pro Val Glu Lys Asn Gly Gly Cys Met 420 425 430 His Met Lys Cys Pro Gln Pro Gln Cys Arg Leu Glu Trp Cys Trp Asn 435 440 445 Cys Gly Cys Glu Trp Asn Arg Val Cys Met Gly Asp His Trp Phe Asp 450 455 460

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| Pro Val Leu Va 115 | Phe Glr | Cys Asr 120 | | Arg His | | Ile 125 | Cys | Leu | Asp | |
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| atg ata gtg tt Met Ile Val Pho 1 gtc gat tct gao Val Asp Ser As | v Val Arg 5 : acc ago Thr Ser : cca gct | Phe Asr atc tto Ile Phe | cag Gln 25 | Ser Tyr 10 ctc aag Leu Lys | gaa Glu att Ile | Phe gtg Val | gtt Val 30 | val 15 gct Ala | aag Lys aaq | |
| atg ata gtg tt Met Ile Val Pho 1 gtc gat tct gae Val Asp Ser Asj 20 cga cag ggg gt Arg Gln Gly Va | v Val Arg 5 cacc ago Thr Ser cca gct Pro Ala | Phe Asr atc tto Ile Phe gac cac Asp Glr 40 aca gta | cag Gln 25 ctg Leu | Ser Tyr 10 ctc aag Leu Lys cga gtg Arg Val cat ccc | gaa Glu att Ile | gtg Val ttt Phe 45 | gtt Val 30 gct Ala | yal 15 gct Ala ggg Gly | aag Lys aag Lys | 96 |
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His Lys Ser His Leu Ala Val His Asn Leu Ser Gln Gln Asp Val Thr 65 70 75 80

Gln Asn Cys Asp Leu Glu Gln Gln Ser Ile Val His Ile Val Gln Arg 85 90 95 Page 21

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Gly Val Leu Cys Pro Arg Pro Gly Cys Gly Ala Gly Leu Leu Pro Glu 355 360 365

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Val Asp Gln Arg Ala Ala Glu Gln Ala Arg Trp Glu Glu Ala Ser Lys 420 425 430

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| Leu | Ile | Lys | Glu | Leu 325 | | | | 0020 Arg | | | | | | | | |
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| Gln | Gly 370 | Gln | Lys | Lys | val | Thr 375 | Cys | Glu | Gly | Gly | Asn 380 | Gly | Leu | Gly | Cys | |
| Gly 385 | Phe | ٧a٦ | Phe | Cys | Arg 390 | Asp | Cys | Lys | Glu | Ala 395 | Tyr | His | Glu | Gly | G]u 400 | |
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